

PROCEEDINGS  
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DESCRIPTIONS OF THIRTY APPARENTLY NEW  
GRIZZLY AND BROWN BEARS FROM  
NORTH AMERICA.

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The present publication contains preliminary descriptions of thirty apparently undescribed species and subspecies of the big Bears—Grizzlies and big Brown Bears—of various parts of western America from northern Mexico to Arctic Alaska. This will be followed in the near future by more complete descriptions with fuller comparisons, known ranges, measurements and other matter, illustrated by photographs of skulls and teeth.

Most of the species here published have been in manuscript for several years, and have been held back awaiting the acquisition of fuller material. Through the kindly cooperation of the principal museums of America\* and of a considerable number of sportsmen and hunters, enough skulls—more than 500—have now been brought together to admit of working out the characters of most of the species, though much remains to be done in the way of mapping their geographic ranges.

It will be a surprise to many to be told that until within a few months no museum in America contained either a skin or a skull of the adult male of the great Plains Grizzly *Ursus horribilis*—the “White Bear” of Lewis and Clark—the first Grizzly to receive a scientific name. Until recently, not only were the characters of this splendid species unknown, but there was no certainty

\* American Museum of Natural History, New York; Carnegie Museum, Pittsburg; Field Museum of Natural History, Chicago; Museum of Comparative Zoology, Cambridge; Provincial Museum, Victoria, B. C.; Victoria Memorial Museum, Ottawa; Peabody Museum of Yale University; Museum of Vertebrate Zoology, University of California; and the Museums of the Universities of Iowa, Nebraska and Wyoming.

as to which of three neighboring species was entitled to the name.

The specimens in hand prove that in several parts of the Rocky Mountain region of the United States and British Columbia and in parts of southeastern Alaska, two perfectly distinct species—in some cases three—occupy the same territory. This is a rather startling announcement but one concerning which there is not the shadow of a doubt.

The list of persons who have aided me by the loan of material is too long for publication in the present connection, but it is a pleasure as well as a duty to express my appreciation of the invaluable assistance rendered by the loan or presentation of skins and skulls of Grizzly and Brown Bears utilized in the preparation of the following descriptions. The persons who have helped me in this way are: Miss Annie M. Alexander, C. E. Aiken, Dr. J. A. Allen, Edward F. Ball, H. C. Beggs, Mrs. C. C. Beggs, John P. Bird, Robert K. Blake, W. C. Bradbury, Fred K. Burnham, Mr. and Mrs. E. S. Cameron, Elton Clark, Charles B. Cory, Charles R. Cross, Jr., Howard Eaton, J. D. Figgins, Joseph Grinnell, Samuel Henshaw, Dr. W. J. Holland, Dr. R. Houston, James T. Jardine, Francis Kermode, J. H. Kidder, Paul Kleineidam, Prof. S. H. Knight, Frederick Lambart, J. D. McGuire, George Mixter, Dr. Wm. Jason Mixter, G. Frederick Norton, Prof. C. C. Nutting, John M. Phillips, Warburton Pike, Wilson Potter, George D. Pratt, Dr. E. P. Richardson, Archibald Rogers, Carl Rungius, Homer E. Sargent, Professor W. B. Scott, Charles Sheldon, George Shiras, 3d & 4th, P. A. Taverner, E. R. Warren, A. Bryan Williams, W. W. Wood.

***Ursus alexandrae* \* sp. nov.**

*Type* from Kusilof Lake, Kenai Peninsula, Alaska. Sept. 1906. No. 4752 ♂ old, Mus. Vert. Zool., Univ. Calif. Orig. No. 218. (Skull, skin and skeleton complete.)

*Characters*.—Size large; skull long and narrow with exceptionally broad rostrum; pelage very uniform in color, scarcely or not grizzled. Claws enormous (2d foreclaw of type specimen measuring: length from upper base 91 mm.; height at base 25 mm.; breadth 11.5 mm.). The

\* Named in honor of Miss Annie M. Alexander of Oakland, California, whose collection of Alaska Bears is second only to that of the Biological Survey and National Museum.

longest claw in Wilson Potter's specimen measures 120 mm.; in the male killed by Dall DeWeese 110 mm.

*Color.*—(Type specimen, very old male, in fresh short fall pelage:) pale, almost grayish, brown, becoming yellowish brown between ears, contrasting with pale brown of muzzle; legs and feet only slightly darker than back—entire animal remarkably unicolor; underfur plumbeous, crinkled and woolly. Another male, killed by Wilson Potter of Philadelphia in May, 1912 (belonging to skull No. 181102 U. S. Nat. Mus., Biological Survey Coll.—presented by Wilson Potter), is pale buffy inclining to light "reddish brown" throughout, without grizzly appearance; legs only slightly darker. One killed by Dall DeWeese of Canyon City, Colorado, Sept. 7, 1897, is described by him as "grayish-yellow," with legs and sides chocolate brown.

*Cranial characters.*—Skull large, long, rather narrow, with moderately spreading zygomata, short flattish frontal shield, outstanding postorbitals (with age); *very broad rostrum*, and long and high sagittal crest. Frontal shield not markedly elevated above plane of rostrum; posterior root of zygoma not expanded. Canines large and long.

*Skull of male adult compared with male adult kenaiensis*—the only other large bear known to inhabit Kenai Peninsula: Basal length, palate, and occipito-sphenoid essentially same; skull as a whole much narrower, frontal shield interorbitally and across postorbital processes *much narrower*, flatter, more horizontal, not materially elevated above plane of rostrum; zygomata much less widely spreading, squamosal part much narrower (not expanded); sagittal crest much longer, reaching anteriorly over posterior  $\frac{1}{3}$  of frontals [in *kenaiensis* ending on or near fronto-parietal suture]; posterior third of frontals compressed, rising in a keel to sagittal crest; condyle of jaw, and glenoid fossa short (not produced outwardly as in *kenaiensis*). Canine teeth, both upper and lower, but especially the lower, much larger and longer.

*Remarks.*—The skull of *Ursus alexandrae* is of a generalized type, lacking the special distinctive features that characterize several of its neighbors—as *kenaiensis*, *sheldoni*, and others—none of which are Grizzlies. Among the Grizzlies it stands alone in the *great breadth of the rostrum*—which in bears of its size is only exceeded by the widely different *Ursus kenaiensis*, which can not be classed as a Grizzly. *Ursus alexandrae* attains to the largest size known among the Grizzly Bears, the biggest skulls equalling those of the huge *Ursus magister* of Southern California.

#### ***Ursus eltonclarki* \* sp. nov.**

*Type* from near Freshwater Bay, Chichagof Island, the more northern of the Sitka Islands, Alaska. ♂ adult No. 179066 U. S. Nat. Mus., Biological Survey Coll. Collected May 19, 1912, by Elton Clark and by him presented to Biological Survey.

*Characters.*—Size medium or rather small; skull small, long, narrow, and rather low, with flat frontal shield. Claws of true Grizzly type—smoothly polished; strongly curved and rather short; longest claw (in

\* Named in honor of Elton Clark, of Boston, who killed and presented the type specimen.

type specimen) from upper base 70 mm; dark bluish or plumbeous horn color streaked with whitish or yellowish.

*Color.*—Color of type very dark and rich. Nose pale brown, darkening just in front of eyes; face, head, and throat rich dark chocolate brown, with golden brown wash in front of ears; ears and patch under each ear dusky; occiput and neck grizzled golden brown; back pale, overlaid by buffy tips; legs and feet varying from blackish brown to brownish black.

*Cranial characters.*—Skull of male adult (the type) elongate, narrow; zygomata moderately spreading, outbowed, rounded posteriorly, squamosal part not vertically expanded; frontal shield in same plane with rostrum, narrow, flat or slightly concave, acutely rather short-pointed posteriorly, the point entering sagittal crest about one-third the distance from fronto-parietal suture to postorbital processes; sagittal crest moderate, reaching a little more than half way from occiput to postorbital processes; postorbital processes rather thick, outstanding; fronto-nasal region elevated (not dished); rostrum high and sloping gently upward in plane of frontals; lacrymal opening within orbit; palate long and narrow; postpalatal shelf long; postpalatal notch long and narrow; occipito-sphenoid short, about 80 mm.; basisphenoid deeply concave, without trace of median ridge. Lower jaw long. Teeth moderate: canines rather long; pm<sub>4</sub> with moderately sloping heel slightly upturned at tip, sulcus very shallow; m<sub>1</sub> rather short, with cusplet on inner side of saddle posteriorly; m<sub>2</sub> with anterior moiety decidedly longer than posterior and twin cusps of entoconid small and not deeply notched; pm<sup>1</sup> large and broad; m<sup>1</sup> broad and rather short; m<sup>2</sup> broad in anterior half, then narrowing strongly, the heel obliquely truncate on outer side; cusps rather weak.

Skull of adult female similar, but much smaller, distinctly dished, point of shield lyrate, zygomata more angular.

*Adult male eltonclarki (the type) compared with adult orgilos (the type):* Size essentially same; vault of cranium higher; rostrum and fronto-nasal region longer and more elevated; postorbital processes heavier and shorter; occipito-sphenoid much shorter (80 mm. contrasted with 90); mandible more massive. Canines larger and longer; m<sub>1</sub> shorter; m<sup>1</sup> and m<sup>2</sup> shorter and broader (m<sup>2</sup> broader in middle).

#### **Ursus orgilos** sp. nov.

*Type* No. 180280 (rather old), U. S. Nat. Mus., Biological Survey Coll. From Bartlett Bay, east side Glacier Bay, southeastern Alaska. August 22, 1912. A. Hasselborg.

*Cranial characters.*—Size medium; skull long, rather narrow, low, flat on top, slightly dished. Rostrum normal or rather small; nasals nearly horizontal, slightly decurved (not uplifted) anteriorly, slightly ascending posteriorly into frontal shield; shield rather narrow, flat, concave between orbits, acute pointed posteriorly; postorbital processes long, slender, outstanding, slightly decurved and recurved (posteriorly); braincase long and low; squamosal shelves long; zygomata moderately spreading and

strongly outbowed, the broadest part more anterior than usual; sagittal crest straight and nearly horizontal; palate long and rather narrow; post-palatal shelf long and flat; jugal broad anteriorly, rising well above lachrymal duct; lachrymal duct opening within orbit; occipito-sphenoid long (90 mm.); lower jaw long. Teeth of medium or rather small size.

*Remarks.*—The sex of the type skull is not known. Assuming it to be a female, its male, or one closely related, is No. 98101 U. S. Nat. Mus., Biological Survey Coll., male ad., presented to me at Sitka in 1899 by Governor Brady of Alaska. This latter skull is considerably larger, has much larger canines, but slightly smaller upper molars. The two skulls are closely similar in general form and characters except that in the male No. 98101 the posterior frontal region is a little more elevated, the frontal shield more strongly concave between orbits, the postorbital processes heavier (broader) and more decurved.

#### ***Ursus innuitus* sp. nov.**

*Type* No. 179780 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Golofnin Bay, south side of Seward Peninsula, northern Alaska. Collected in 1886 by Edward F. Ball.

*Cranial characters.*—Size large, basal length essentially same as in *horribilis* and *alexandrae* but occipito-nasal length much less, owing to shortness of occiput; fronto-nasal region strikingly dished; rostrum short, exceedingly broad (of same breadth as in *alexandrae*, very much broader than in *horribilis*), strongly depressed; frontal shield exceedingly broad interorbitally, rising high and abruptly from rostrum, nearly horizontal behind plane of postorbital processes, rather deeply sulcate medially and strongly swollen over orbits; postorbital processes large, subtriangular, outstanding and decurved; nasals nearly horizontal; palate and postpalatal shelf broad; zygomata broadly spreading and outbowed posteriorly, acute anteriorly; nares broader than high; sagittal crest high posteriorly; lambdoid crest large and full; coronoid blade narrow and high; ramus long and flat. Canines badly broken, apparently long; last lower premolar broad, broader posteriorly than anteriorly, the cusp small and sloping posteriorly without heel or marginal cusplets, but with narrow sulcus; molars exceptionally large and broad, the last upper one with heel strikingly long and broad—agreeing almost exactly with that of true *horribilis* from eastern Montana.

*Remarks.*—*Ursus innuitus* appears to be related to *horribilis* although their ranges are separated by an interval of about 2000 miles. Ignoring minor differences, *innuitus* differs from *horribilis* rather strikingly in the low short flattish and exceedingly broad rostrum, abruptly ascending frontal shield, and truncate occiput. The teeth, as above stated, are strikingly alike.

#### ***Ursus internationalis* sp. nov.**

*Type* ♂ adult, No. 1763 Ottawa Museum. Killed on Alaska-Yukon Boundary about 50 miles south of Arctic Coast (lat. 69° 00' 30''), July 3, 1912, by Frederick Lambert of the Canadian Boundary Survey.

*Skull* similar to that of *phuonyx* but shorter; frontal shield more deeply and broadly sulcate (sides of sulcus rising very gradually); postorbital processes thicker and more decurved; orbital rims more elevated (almost everted); sagittal crest lower and more sloping (probably higher and more horizontal in advanced age); palate and postpalatal shelf *much shorter*; postpalatal notch not truncate; occipito-sphenoid length decidedly less (84 against 96). Last lower premolar conical and much smaller, lacking heel and without trace of posterior sulcus or marginal cusplets (in *phuonyx*, heel, sulcus, and posterior cusplets well developed); 1st lower molar swollen; middle lower molar swollen and convex on inner side.

***Ursus russelli* sp. nov.**

*Type* No. 21301 ♂ old, University of Iowa Museum, collected on the Mackenzie Delta June 28, 1894, by Frank Russell. (Mounted skin with skull separate.)

*Characters*.—Size rather small. Color a curious pale drab brown, somewhat darker on legs and feet; ears conspicuously hairy. Claws smooth, moderately to strongly curved; brownish horn color with paler (almost amber) tips.

*Cranial characters*.—Skull of medium size, about equaling old males of *alascensis*; rather short; fairly broad across zygomata; frontal shield sloping strongly upward, moderately sulcate, swollen over orbits but orbits not everted; posterior point of shield rather short, ending about one-third the distance from fronto-parietal suture to postorbital processes; postorbital processes peg-like, standing out nearly horizontally—not depressed as in *alascensis*; muzzle rather narrow and high; zygomata slender, the posterior roots not expanded vertically; palate flat—not excavated or arched as in several species; lower jaw massive, heavier under second and third molars than in *alascensis*; coronoid blade falcate but not narrowly so.

From its neighbor on the east, *Ursus richardsoni*, to which it may prove more nearly related than to any other species, and with the larger specimens of which it agrees in size and in certain dental characters, it differs in much more highly vaulted cranium; more highly sloping (less horizontal) braincase; much more elevated frontal region, and *very much narrower rostrum*. The frontal shield is much longer than in *richardsoni*, the temporal impressions curving backward to meet one another about  $\frac{1}{3}$  the distance between postorbital processes and fronto-parietal suture, instead of turning abruptly inward; postorbital processes more slender than in *richardsoni*; sagittal crest shorter and less horizontal; upper molars very much larger, particularly broader. The zygomatic arches are bowed outward in both species—not sharply angular as in many of the large bears.

***Ursus stikeenensis* sp. nov.**

*Type* from Tatletney Lake, near head of Skeena River, northern British Columbia. No. 202794 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 23, 1913, by Chas. R. Cross, Jr., and E. A. Preble. Orig. No. 5772.

*Characters.*—Size medium; skull short and broad; claws short and strongly curved for a Grizzly (longest 60 mm.—tips worn by digging), dark, marked with yellowish on tips and sides. Upper molars large. Total length before skinning 1830 mm.; hind foot 267 mm.; estimated height at shoulder 39 inches (990 mm.).

*Color.*—General ground color dark brown, grizzled and washed with pale tipped hairs. Muzzle pale brown, becoming darker between eyes and on sides of face; top of head in front of ears washed with yellowish brown—almost forming a golden brown band between the darker ungrizzled frontal region and the more whitish color of the neck; general ground color of body very dark, bountifully overlaid on neck and back by pale buffy-tipped hairs which give a whitish cast to the neck; ears dark; legs and feet blackish; under parts dark brown; hairs on sides of throat long and grizzly.

*Cranial characters.*—Size medium; skull short, broad, highly arched, strongly dished, with abruptly ascending frontals and large molar teeth. Muzzle short, broad, broadening and strongly ascending posteriorly; nasals strongly upturned posteriorly; frontal shield rather broad, rising abruptly and swollen in front of and above orbits, sulcate medially, short-pointed, the point ending in sagittal crest about 30 mm. anterior to fronto-parietal suture; postorbital processes large, broad, subtriangular, and decurved, braincase long for size of skull; zygomata rather broadly spreading and slightly outbowed; palate and postpalatal shelf broad. Molars large and broad.

*Male adult stikeenensis compared with male adult absarokus* (apparently its nearest relative): size nearly the same though *absarokus* appears the larger; basal length and frontal breadth approximately same, but occipito-nasal length much greater in *absarokus*. In *stikeenensis* rostrum lower, flatter, and more horizontal; frontal shield and posterior part of nasals rising much more abruptly; frontals much more swollen in front of orbits; point of shield much shorter (ending midway between plane of postorbitals and fronto-parietal suture, while in *absarokus* it reaches posteriorly to suture);inion short; palate broader; lower jaw shorter; coronoid lower.

***Ursus nortoni* \* sp. nov.**

*Type* No. 178763 ♀ adult, U. S. Nat. Mus., Biological Survey Collection. From Yakutat, Alaska. May, 1910. G. Frederick Norton. Original No. A5 (mother of ♂ cub No. 178764).

*Characters.*—Belongs to the Grizzly group; related to *stikeenensis*. Size medium; coloration pale; skull broad and massive.

*Cranial characters.*—Skull large, broad, with moderately spreading rounded zygomata, broadly expanded squamosal shelf, broad frontal region, and moderately dished fronto-nasal area. Frontal shield broad and long, its lyrate point reaching back to middle of parietals; postorbital processes large and broadly outspreading; rostrum broad, short, and somewhat depressed; palate and postpalatal shelf broad; occiput broad,

\* Named in honor of G. Frederick Norton, who collected the type specimen and presented it to the Biological Survey.

low, trimate. Incisors large; canines and molars rather small for size of skull. Skull of adult male unknown.

***Ursus imperator* sp. nov.**

*Type* from Yellowstone National Park, Wyoming. No. 176297 ♂ old, U. S. Nat. Mus. (Died in National Zoological Park.)

*Cranial characters.*—Size large (slightly larger than *absarokus*); skull of old male (the type) massive, moderately arched, strongly dished, with exceedingly short frontal shield, long and high sagittal crest, and long peg-like outstanding postorbital processes. Muzzle short, narrow for so large a skull, somewhat compressed below nasals; nasals nearly horizontal; frontal shield rising strongly just in front of orbits, flattish, shallowly sulcate medially, ending in short obtuse point about 30 mm. behind plane of postorbitals; postorbitals long, peg-like, horizontally outstanding; braincase long; lachrymal duct opening on orbital rim; zygomata moderately outstanding and outbowed, the squamosal base broadly expanded; squamosal shelves broad, arched over meatus; palate moderate; postpalatal shelf long; occipito-sphenoid 91 mm.; mastoids short; lower jaw large, long, and massive, with high vertical coronoid blade. Teeth large.

*Old male imperator (the type) compared with old male absarokus* (No. 2893 U. S. Nat. Mus.): Size larger; frontal shield broader; postorbital processes longer and more widely outstanding; rostrum higher and more horizontal (in *absarokus* lower anteriorly and more sloping); sagittal crest longer, its free edge nearly straight instead of arched; squamosal root of zygoma very much more expanded vertically; palate much longer; lower jaw longer and more massive.

*Compared with old male stikeenensis* (No. 171049): Much larger and more massive; frontal shield flatter; squamosal base of zygoma very much more broadly expanded; palate and postpalatal shelf much longer; lower jaw much longer; coronoid blade much higher and more vertical.

*Old female imperator* (No. 177660 U. S. Nat. Mus., Biological Survey Coll., collected near Lake Hotel, Yellowstone National Park, July 20, 1911, by Dr. P. S. Kellogg): Size large; zygomata moderately spreading, only slightly outbowed; braincase rather short, broadly rounded, without tendency to "keeling"; frontal shield rather broad, flattish, slightly convex laterally, slightly sulcate medially, its sub-lyrate point reaching fronto-parietal suture; postorbital processes rather large and short, outstanding, blunt or subtriangular, decurved; fronto-nasal region somewhat dished; rostrum broad, high, and rather short; lachrymal duct cutting orbital rim; squamosal arm of zygoma moderately expanded, the anterior root strongly swollen under front of orbit; sagittal crest moderate, nearly covering parietal; occiput obliquely truncate;inion moderate; palate broad; occipito-sphenoid about 80 mm.; lower jaw large and massive. Teeth large, much as in female *absarokus* but upper molars broader; canines and molars much larger than in female *Ursus shoshone*.

*Old female imperator (No. 177660) compared with old female stikeenensis* (No. 180981): Skulls surprisingly alike in size, general form, and propor-

tions. In *imperator* posterior frontal region less elevated; postorbital processes shorter; squamosal base of zygoma much more expanded vertically—differences that seem trivial by comparison with those that characterize the male skulls.

*Old female imperator compared with adult female absarokus* (from head Big Porcupine Creek, Montana, No. 13245 U. S. Nat. Mus.): Size essentially same; nasals more horizontal; fronto-nasal region much more dishd; frontal shield much broader; postorbital processes much more massive; squamosal root of zygoma broadly expanded [in *absarokus* not expanded]; palate much broader; upper molars broader.

**Ursus absarokus** \* sp. nov.

*Type* No. 67391 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. From head of Little Bighorn River, northern part of Bighorn Mts., Montana. Purchased for the Biological Survey in May, 1893, by J. Alden Loring.

*Characters*.—Size large, but much less than *horribilis* and with much smaller molars—especially  $m^2$ . External characters unknown.

*Skull of male* (type specimen).—Vault of cranium rather highly arched; zygomata moderately outspreading and somewhat bowed; frontal shield of moderate breadth, rising strongly from ascending rostrum, convex at and behind plane of postorbital processes, swollen on each side of median line just behind plane of orbits; postorbital processes large, outstanding, and slightly decurved, the tips bluntly rounded; sagittal crest nearly straight, highest posteriorly, reaching anteriorly to fronto-parietal suture; postpalatal shelf broad and flat; nasals large; nares normal or rather small for size of skull; rostrum high, of moderate length and breadth, rising strongly into frontal shield; top of coronoid broadly rounded, its apex short, not reaching posteriorly to plane of condyle. Teeth rather large, especially  $m^2$  which is long and broad, the heel emarginate on outer side.

*Skull of female* (No. 13245 U. S. Nat. Mus. From head of Big Porcupine Creek [not Porcupine River] between Musselshell and Yellowstone Rivers, eastern Montana).—Of generalized Grizzly type; large and rather massive; vault of cranium rather flat; braincase rather broad; frontal shield of moderate breadth, slightly convex, slightly depressed or sulcate between orbits, elongate-lyrate posteriorly; postorbital processes weak and slightly decurved; sagittal crest not yet reaching fronto-parietal suture; muzzle moderate or rather short; zygomata moderately spreading and rather angular; palate rather narrow. Teeth large;  $m^2$  large and subrectangular.

**Ursus tahltanicus** sp. nov.

*Type* No. 179928 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Klappan Creek (=3d So. Fk. Stikine River), British Columbia. Collected and presented by G. Frederick Norton.

*Characters*.—Size medium (skull of male slightly smaller than male *stikeenensis* and *canadensis*; skull of female about same size as female *stikeenensis*, decidedly larger than female *canadensis*). Color of type

\* Named for the Absaroka or Crow tribe of Indians, in whose territory they occur.

specimen black (head absent, but entire body and legs almost coal black, lightly grizzled on anterior part of back by tips of golden-brownish).

*Cranial characters.*—Adult and old males: Rostrum rather narrow (in old age compressed in front of orbits); vault of cranium low, flattish; frontal shield of moderate breadth, flat or depressed (sometimes sulcate medially), rather short-pointed, sloping gradually to plane of muzzle, and only slightly dished in fronto-nasal region; postorbital processes peg-like, horizontally outstanding; sagittal crest low, reaching forward about half-way (in extreme age a little more than halfway) frominion to postorbitals; zygomata broadly spreading and bowed; palate of median breadth; postpalatal shelf broad and flat (in type, an aged skull, less broad); squamosal shelves broad; squamosal root of zygoma not vertically expanded; infra-jugal process of maxillary rather strongly developed; lower jaw short—much shorter than in *stikeenensis*, *shoshone*, and *canadensis*; its ramus not flattened. Teeth rather small: canines and molars much smaller than in *stikeenensis*.

Skull of female relatively large (about same length as female *stikeenensis* but much narrower; much larger than female *shoshone* and *canadensis*; vault of cranium moderately elevated, with tendency to fronto-parietal hump; facial part of skull large and long; frontal shield long, rather narrow, lyre-shape posteriorly, meeting sagittal crest some distance posterior to fronto-parietal suture; fronto-nasal region well dished; palate and postpalatal shelf long; zygomata moderately spreading and conspicuously outbowed; under jaw long.

Young females are best told by the teeth, especially the lower canines. In *tahltanicus* the lower canines are shorter and more slender than those of *stikeenensis*. In the latter species they are longer and thicker—especially thick in middle.

#### ***Ursus toklat* sp. nov.**

*Type* No. 158813 ♀ ad., U. S. Nat. Mus., Biological Survey Coll. From head of Toklat River, north base of Alaska Range near Mt. McKinley. Collected May 24, 1908, by Charles Sheldon and by him presented to the Biological Survey. Orig. No. 324. Mother of cub No. 158814 (Orig. No. 325).

*Characters.*—Size medium; color variable, the upper parts ranging from ordinary “grizzly bear color” to creamy white; claws horny and smooth, usually dark throughout but in many cases more or less marked with white. Skull of both male and female rather highly arched and dished, that of female much smaller and lower than male and more strongly dished. Last upper molar large; heel very long.

*Cranial characters of adult males.*—Size medium; rostrum high, subterete above, nearly horizontal; frontal shield abruptly elevated, swollen over orbits, sulcate medially, rather long pointed (reaching fronto-parietal suture); postorbital processes rather small and strongly decurved; squamosal shelves short; palate arched and excavated longitudinally; zygomata very *broadly spreading* and angular (zygomatic

breadth in proportion to basal length much greater than in any other true Grizzly, about equalling that of *Ursus sheldoni*); sagittal crest short. Last upper molar large, its heel normally very long.

*Cranial characters of adult females.*—Skull rather long and narrow, with broadly spreading zygomata and strongly dished fronto-nasal region; frontal shield rather flat, becoming flatter with advancing age, sulcate between orbits, varying from lyre-pointed to short-pointed; postorbital processes outstanding horizontally; rostrum nearly horizontal. In most specimens the highest point of the cranium culminates in a rather abrupt change of angle at or near the fronto-parietal suture, forming a sort of "hump," a condition usual also in skulls of female Grizzlies from the Upper Yukon and northern British Columbia.

*Old male toklat compared with old male alascensis:* frontal region more elevated; sagittal crest shorter; zygomatic breadth *much greater*; heel of last upper molar *much longer*.

*Old male toklat compared with old male phaeonyx:* length about the same; zygomatic breadth very *much greater*, particularly with reference to basal length; frontals *much more highly arched*; sagittal crest shorter and lower; last upper molar larger—the *heel much longer*.

*Adult female toklat compared with that of alascensis:* size decidedly smaller; vault of cranium decidedly lower, highest over posterior part of frontals instead of over middle of frontals; frontal shield narrow, flattened, sloping (not arched and not materially swollen over orbits); postorbital processes outstanding horizontally; fronto-nasal region *strongly dished*; palate, post-palatal shelf, and occipito-sphenoid shorter;  $m^2$  with *heel much longer*.

*Adult female toklat compared with adult female phaeonyx:* size decidedly greater; teeth much larger, especially the canines and last upper molars.

#### ***Ursus phaeonyx latifrons* subsp. nov.**

*Type* ♂ old, No. 75612 U. S. Nat. Mns., Biol. Survey Coll. Collected at Jasper House, Alberta, Sept. 15, 1895, by J. Alden Loring (original No. 3270).

*Characters.*—Size medium; skull moderately arched and moderately dished; base of skull elongate posteriorly; frontal shield very broad (interorbitally 93; between postorbital processes 130), rising from rostrum rather abruptly, broadly sulcate medially, convex over orbits; postorbital processes rather large and outspreading, slightly decurved; orbital rims thickened; rostrum rather high, nearly horizontal, its upper surface rounded (subterete); zygomata moderately spreading and broadly out-bowed, the squamosal part moderately expanded vertically; palate 175 mm., postpalatal shelf broad; postpalatal length 145; occipito-sphenoid 89; sagittal crest well developed; lower jaw as a whole, and inferior border of ramus long; coronoid moderately falcate. Teeth of moderate size (very badly worn in type skull).

*Compared with phaeonyx.*—Size and general characters essentially same, but frontal shield broader; postorbital processes much larger and more

outstanding; base of cranium longer (postpalatal length and occipito-sphenoid slightly greater); outer side of zygomata straighter (less bowed); meatus tube longer; lower jaw longer; angle and condyle more elevated.

***Ursus shoshone* sp. nov.**

*Type* from Estes Park, Rocky Mts. of northern Colorado. No. 203185 ♂ old, U. S. Nat. Mus., Biological Survey Coll. Purchased.

*Characters*.—Size medium or rather large, but much smaller than *horribilis* and *bairdi*—about same size as *absarokus* but narrower and widely different. External characters unknown.

*Cranial characters*.—Skull rather long and high, with flattish long-sloping frontal shield continuing plane of rostrum to high point about midway between postorbitals and fronto-parietal suture; moderately spreading zygomata; anterior (frontal) part of braincase keeling into sagittal crest; sagittal crest long and high; lambdoid crest high; post-orbital processes peg-like, outstanding, rather slender; nasal region slightly dished and sulcate in middle third (nasals dipping toward one another—may be individual); rostrum of moderate breadth, strongly ascending in plane of frontal shield; lachrymal duct on inner aspect of orbital rim.

*Skull of adult female* (from Ft. Fred Steele, Wyoming, No. 203761 U. S. Nat. Mus., Biol. Survey Coll.): Skull long, low, and rather slender; frontal shield narrow, long lyre-pointed posteriorly, flat interorbitally, slightly convex (transversely) from plane of postorbitals posteriorly; a slight depression on each frontal on inner (medial) side of postorbital process; postorbitals slender and outstanding; rostrum slender; sagittal crest short, reaching only half way frominion to fronto-parietal suture; lambdoid crest moderate; meatus tube short; apex of coronoid produced posteriorly, overhanging deep coronoid notch; ramus flat and light. Teeth rather small; upper molars relatively large; lower molars narrow.

*Adult male shoshone compared with adult male horriacus*: Rostrum, nasals, and frontal shield more elevated and much more strongly ascending posteriorly (less flattened and less horizontal); lambdoid much more strongly developed.

*Adult male shoshone compared with adult male absarokus*: Frontal shield flat, rising gradually in long continuous slope to highest point, about 25 mm. anterior to fronto-parietal suture [in *absarokus* arched, strongly convex, and rising suddenly to highest point, immediately behind orbits]; postorbital processes more slender; fronto-nasal region only slightly dished; rostrum more slender; braincase narrower; breadth across squamosal shelves less.

***Ursus shoshone canadensis* subsp. nov.**

*Type* from Moose Pass, near Mt. Robson, British Columbia. No. 174511 ♂ ad., U. S. Nat. Mus. Collected by N. Hollister and Charles D. Wakecott, Jr., July 23, 1911. Orig. No. in Hollister catalogue 3792.

*Characters* (Type specimen).—Size medium; color brown, grizzled with

buff; claws short for a Grizzly, rather thick, moderately curved, pale yellowish on upper surface and tips, brownish horn color on sides.

*Color.*—Muzzle very pale drab brown, changing to darker brown on head, face, and chin; darkest around ears; top of head, cheeks posteriorly,\* ears, back and thighs washed with buffy whitish from abundance of buffy-tipped hairs; fore leg and lower part of hind leg and feet very dark (almost blackish brown); long hairs of throat and axillary region pale yellowish; of rest of under parts dark brown.

*Cranial characters.*—(Ad. male, the type) Similar in general to *shoshone* but vault of cranium lower, frontal shield less ascending, flatter, and equally short posteriorly; postorbital processes long, slender, slightly decurved; rostrum narrowing anteriorly (wedge shape); posterior half of nasals rising in same plane with frontal shield; sagittal crest long, high, and convex, reaching anteriorly about 40 mm. over frontals; frontal part of braincase keeling into crest as in *shoshone*; zygomata less outbowed; lower jaw longer; coronoid blade broader and shorter. Canines rather short and thick. Molars broad and rather short, materially broader and more massive than in *shoshone*; m<sup>2</sup> broadly subtriangular, the heel short and rounded posteriorly.

#### ***Ursus klamathensis* sp. nov.**

*Type* No. 178735 ♂ adult, U. S. Nat. Mus., Biological Survey Coll. From Beswick, near mouth of Shovel Creek, Klamath River, north-eastern California. Collected and presented by Charles Farwell Edson.

*Characters.*—Size of male large; skull in general of the *shoshone* type, but larger and with heavier canines. Claws moderate, rather strongly curved, horn color washed with yellowish basally and with pale yellowish markings at tips; marked longitudinally with fine parallel striae. Skin characters unknown.

Curiously enough, *Ursus klamathensis* does not require close comparison with any of the other species inhabiting California, its only near relative being *Ursus shoshone* of the Rocky Mts. of Idaho. Female unknown.

*Cranial characters.*—Skull large and rather highly arched; highest on posterior part of frontals; rostrum long, high, and ascending in plane of frontal shield; fronto-nasal region elevated, scarcely if at all dished; sagittal crest long and well developed; frontal shield flat, sloping, and rather short-pointed; lachrymal duct opening on orbital rim (rather posteriorly than anteriorly); zygomata moderately spreading, not expanded posteriorly; † anterior (frontal) part of braincase “keeling” into sagittal crest; occiput produced posteriorly (overhang much greater than in *californicus*); squamosal shelves long and broad; palate rather flat; occipito-sphenoid length 89 mm.; basioccipital very broad anteriorly; mastoids vertical, short; lower jaw long; coronoid blade high; ramus exceptionally broad

\* The long whitish-tipped hairs of the old coat have fallen out on the cheeks and anterior part of head nearly to ears.

† An old skull of an ad. male (No. 16621 U. S. Nat. Mus.) from Baird on the lower McCloud River, Calif., has the posterior or squamosal part of the zygomata abruptly expanded.

vertically. Canines large; molars moderate; last upper molar relatively small, the heel emarginate or obliquely truncate on outer side; middle lower molar with anterior moiety much larger than posterior.

Compared with an old male *shoshone* from North Fork Teton River, eastern Idaho (No. 93 Merriam Coll.): Similar in general form and proportions but larger (basilo-condylar length 350 contrasted with 335); vault of cranium somewhat higher; frontal shield broader and flatter; palatal length about the same; postpalatal length much greater (150 contrasted with 135); opening of lachrymal duct slightly more posterior; basioccipital anteriorly very much broader; lower jaw decidedly longer; ramus much broader vertically. Canines larger and longer; last upper molar shorter.

In size and characters *klamathensis* resembles *pervagor* of the coast region of British Columbia, but the two differ markedly in certain specific characters. Omitting details, in *klamathensis* the rostrum and frontal shield form a continuous slope; in *pervagor* the nasal region is dished; in *klamathensis* the ramus of lower jaw is broadly expanded vertically; in *pervagor* normal; in *klamathensis* the canines are large, the molars moderate; in *pervagor* both canines and molars are exceptionally small. In both the basioccipital is broad.

Contrasted with old male *henshawi* of the southern Sierra, male *klamathensis* may be distinguished at a glance by its much larger size, much higher vault of cranium, elevated fronto-nasal region, and continuously sloping frontal shield and rostrum—in striking contrast with the depressed and strongly dished fronto-nasal region of *henshawi*.

Compared with *Ursus californicus* from the coast region south of San Francisco Bay, the differences are marked in the skull and striking in the teeth. In *klamathensis* the vault of the cranium is lower posteriorly and higher anteriorly; the frontal shield flatter laterally; the rostrum shorter; the base of the cranium (occipito-sphenoid) decidedly shorter. The last upper and middle lower molars are widely different, the heel of  $m^2$  in *californicus* large, long, and broad posteriorly, while in *klamathensis* it is small and emarginate on outer side; the anterior part of  $m_2$  in *californicus* normal, while in *klamathensis* it is disproportionally large.

#### ***Ursus pervagor* sp. nov.**

*Type* from Pemberton Lake, British Columbia, in edge of humid coast strip, ♂ ad., No. 187887 U. S. Nat. Mus. (=No. 6510 Merriam Coll.). May, 1883. John Fannin.

*Cranial characters.*—Size large; skull of adult male long, rather narrow, highly arched, moderately dished; zygomata moderately spreading and outbowed; frontal slope gradual; frontal shield of moderate breadth, rather flat, rising gradually to halfway between plane of postorbital processes and fronto-parietal suture, slightly decurved posteriorly, shallowly sulcate medially, swelling on each side just behind plane of postorbitals; postorbital processes outstanding, thick, peg-like; postpalatal shelf broad and flat; frontal part of braincase elevated, supporting pos-

terior part of frontal shield; palate long; squamosal shelf long; lachrymal duct opening on orbital side of orbital rim; mastoid processes long; interpterygoid fossa short and broad; lower jaw long; coronoid broad; ramus long and swollen on outer side. Teeth small, particularly the canines and lower molars.

***Ursus caurinus* sp. nov.**

*Type* from Berners Bay, east side Lynn Canal, southeastern Alaska. ♀ ad., No. 176591 U. S. Nat. Mus., Biol. Survey Coll. Collected June 8, 1911, by A. Hasselborg.

*Characters.*—Size rather large; skull long and rather narrow; canines long, the lower ones massive; claws smoothly polished.

*Color.*—Upperparts yellowish buff; face and most of head pale brown or drab; ears, hump, and underparts conspicuously darker; legs and feet dark brown or brownish black.

*Cranial characters.*—Skull (both male and female) long and narrow, highly arched, moderately dished, frontal shield narrow, strongly ascending posteriorly; postorbital processes weak and decurved; frontal part of braincase elevated, forming an uplifted base for posterior part of frontal shield; palate long; postpalatal shelf rather narrow; squamosal shelf long; lachrymal duct opening within orbital rim; ramus of jaw vertically flattened and broad.

*Compared with *perrigor*:* Frontal shield narrower; postpalatal shelf narrower; lower jaw and inferior border of ramus shorter; ramus flatter on outer side and broader vertically; coronoid blade narrower and more falcate. Upper canines longer; lower canines conspicuously longer and larger; lower molars longer; heel of large lower pre-molar sloping, without distinct posterior cusplets.

***Ursus colusus* sp. nov.**

*Type* from Sacramento River, Calif. (probably from between Colusa and Sacramento). No. 3837 ♂ old, U. S. Nat. Mus. Collected by the Wilkes U. S. Exploring Expd. and marked "C. P. Ex. Ex. 6.16" (the numerals uncertain, there being indication of a figure in front of the first 6). The words "Grizzly Bear, Sacramento" are written on the right parietal in pencil.

*Cranial characters.*—Skull of old male large, long, and low—in general resembling largest skulls of *californicus* but having very much smaller teeth and differing in numerous cranial characters.

Compared with old male *californicus* from Monterey: fronto-nasal region and rostrum more depressed; postorbitals much smaller and less swollen; orbital rims less swollen; sagittal crest longer; squamosal base of zygoma less expanded; palate broader anteriorly; ramus much less broad vertically; dentition weaker and strikingly different. The canines are too badly broken to admit of satisfactory comparison, but obviously were smaller; the upper incisors and both upper and lower molars are

very much smaller; the heel of  $m^2$  small and strongly emarginate on outer side, of same size and approximately same form as in *klamathensis* but even more strongly constricted on outer side immediately behind second cusp; lower molars of same size as in *klamathensis* though the jaw is much longer.

Compared with *klamathensis*: postorbitals, length of sagittal crest, form of zygomata, and dentition essentially same; but skull longer; vault of cranium *much lower*; frontal shield narrower and much shorter; temporal beads much more strongly incurved; fronto-nasal region *dished* instead of elevated; rostrum *much lower*, more depressed, and more horizontal; ramus longer, less broad vertically; diastema much longer.

The skull of a young-adult female from San Jose Mission (No. 1143 Yale Museum) appears to be a not quite grown female of *Ursus colusus*. The last upper molar is short and subtriangular, the heel emarginate on outer side.

#### ***Ursus californicus tularensis* subsp. nov.**

*Type* from old Fort Tejon, Cañada de las Uvas, Tehachapi Mts., Calif. No. 3536 ♂ old, U. S. Nat. Mus. Collected by John Xantus.

*Cranial characters*.—Skull of adult and old males similar to *californicus* but smaller; base of cranium somewhat shorter; palate slightly shorter; occipito-nasal length decidedly less; braincase decidedly shorter; zygomatic breadth same or slightly greater—the skull as a whole relatively broader than in *californicus*; postpalatal shelf broader; lower jaw materially shorter; first upper molar decidedly smaller (both shorter and narrower); lower series of teeth smaller,  $m_1$  and  $m_2$  particularly smaller, much narrower and less massive; heel of last upper molar less broad than in *californicus*.

*Adult male Tejon Grizzly compared with *Ursus henshawi* (the type) from the southern Sierra*: skull larger and more massive; fronto-nasal region much less dished; rostrum larger, higher, and not depressed; zygomata more broadly spreading; postpalatal shelf broader; coronoid larger and less falcate; ramus broader vertically; last upper molar much larger, the heel long and broad posteriorly, contrasted with the short subtriangular heel of *henshawi*.

Females (adult and old) of the Tejon Grizzly are more easily distinguished than males from their nearest relative, *Ursus californicus*. The skull of the female is much more like the normal female Grizzly type, not resembling the males as does the female of *californicus*. *Compared with female californicus*: skull decidedly smaller; frontal shield behind plane of postorbital processes more elevated and convex—not depressed and concave as in *californicus*; point of shield longer and broader; orbital rims more swollen; sagittal crest shorter and lower; palate at least 10 mm. shorter; occipito-sphenoid about 10 mm. shorter; lower jaw smaller and lighter; last upper molar decidedly smaller. Normal  $m^2$  subrectangular as in *californicus* [in *henshawi* subtriangular and small].

***Ursus magister* sp. nov.**

*Type* No. 160155 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From Los Biacitos, head of San Onofre Canyon, Santa Ana Mts., Southern California. August, 1900 or 1901. Killed and presented by Henry A. Stewart.

*Characters*.—Size of male, huge (estimated weight over 1400 pounds), largest of the known Grizzlies, considerably larger than *Ursus californicus* of the Monterey region, and even than *Ursus horribilis*, the great buffalo killing Grizzly of the Plains (only equalled by the largest *alexandrae* of Kenai Peninsula); sexual disparity great, skull of female hardly half the bulk of male; skull of male of rather a generalized type; not dished. Claws of old female from head of Trabuco Canyon, Santa Ana Mts., exceedingly long, strongly curved, mainly yellowish above.

*Color*.—(Old female from head of Trabuco Canyon): General color dusky or sooty all over except head and grizzling of back. Muzzle gray or mouse brown, palest above; top of head and neck very dark brown sparsely grizzled with pale tipped hairs; back dusky grizzled with grayish; legs and under parts wholly blackish.

*Cranial characters*.—Skull long, vault of cranium well arched, but not abruptly; rostrum long and high; fronto-nasal region elevated, in same plane with frontal shield and rostrum; frontal shield flattish but not flat, slightly sulcate medially and slightly swollen on each side between post-orbital processes, the point reaching fronto-parietal suture; zygomata only moderately spreading, angular, the posterior root somewhat expanded and rising rather abruptly from plane of squamosal shelf; sagittal crest rather short; palate scooped out anteriorly, forming a basin-like depression surrounding the anterior palatine foramina; occipito-sphenoid length 103.5 mm. Teeth large and broad but by no means disproportionate to large size of skull; 1st upper molar broad; last upper molar absent, but from its alveolus and its form in the female, obviously broad, short, strongly triangular, the heel small, narrowed posteriorly, obliquely emarginate on outer side; 4th lower premolar broad, with rather short slightly sloping heel, narrow, imperfect sulcus, without posterior cusplets; 1st lower molar apparently normal (much worn in type specimen); middle lower molar absent in type specimen but apparently normal, judging from the female (in which, however, it is badly worn).

Skull of female of extreme age from Trabuco Canyon (No. 156594, U. S. Nat. Mus., Biological Survey Coll., killed Jan. 5, 1908, by Andrew Joplin and Edward Adkinson): Size small; rostrum short and depressed; fronto-nasal region strongly dished; frontal shield flattish, slightly sulcate interorbitally, short-pointed, beaded posteriorly by elevated temporal impressions, rising rather abruptly at orbits; sagittal crest long and nearly horizontal; palate and postpalatal shelf broad, flat posteriorly, concave anteriorly.

*Measurements* in flesh of old male (the type): Height at shoulder from flat of foot 4 ft. (=1220 mm.); total length, snout to tail  $9\frac{1}{2}$  ft.\*

\* Apparently an error.

(=2900 mm.); sole of largest foot without claws: length 12 in. (=305 mm.); breadth 8 in. (=204 mm.). The old female from Trabuca Canyon measured in the flesh by Andrew Joplin, 6 ft. 3 in.

***Ursus henshawi* sp. nov.**

*Type* from southern Sierra Nevada near Havilah, Kern Co., Calif. No. 15671 ♂ old, U. S. Nat. Mus. Collected in 1875 by Dr. J. T. Rothrock and Henry W. Henshaw.

*Characters*.—Size rather small—by far the smallest of the California Grizzlies; size and general cranial characters as in *horriacus*, but fronto-nasal region strongly dished and rostrum strongly depressed. Last upper molar short and broad, the heel short and subtriangular. Skin characters unknown.

*Cranial characters*.—Skull long, narrow, and rather low, with narrowly spreading zygomata, gently sloping flat-concave frontal shield, massive and somewhat arched postorbital processes, swollen orbital rims, strongly depressed and dished fronto-nasal region, and low depressed rostrum.

Compared with an equally old male *horriacus* (the type, from Coppermines, New Mexico): similar in general, but rostrum strongly depressed; nasals flattened and horizontal anteriorly; *fronto-nasal region strongly "dished"* (in *horriacus* rather high and *not* dished); frontal shield strongly and broadly concave between orbits and between postorbital processes (only faintly sulcate in *horriacus*); more strongly sloping anteriorly; postorbital processes shorter and blunter; orbital rims more prominent, relatively thin, somewhat everted, continuing to lachrymal notch—their prominence anteriorly due in part to presence of a broad sulcus in ascending arm of maxillary immediately in front of orbit; lachrymal duct opening in orbit posterior to orbital rim (in *horriacus*, on or anterior to rim); anterior nares broader than high (contrary true in *horriacus*); lambdoid crest higher; inion much shorter; occipital overhang much less; palate decidedly broader; interpterygoid canal shorter; basisphenoid more deeply excavated on each side of median line; exposed presphenoid longer (probably not constant); mastoid processes much longer and more divergent; anterior part of pterygoids more broadly expanded vertically and articulating with a like expansion of posterior arms of palatines (probably not constant). Upper molars decidedly broader (canines broken off).

***Ursus nelsoni*\* sp. nov.**

*Type* ♀ adult No. 99657 U. S. Nat. Mus., Biol. Survey Coll., from Colonia Garcia, Chihuahua, Mexico. Collected November 13, 1899, by H. A. Cluff.

*Characters*.—Size, smallest of the Grizzly Bears. General color, pale buffy yellowish, varying to grayish-white, grizzled from darker color of underfur. Specimens in worn pelage vary to yellowish-brown and even rusty. Hairs of throat and flanks longer than elsewhere; belly sparsely haired, lacking the thick underfur of upper parts.

\* Named in honor of E. W. Nelson, who secured a series for the U. S. Biological survey.

*Description of type specimen in fresh fall pelage.*—Muzzle pale brown, much darker around eyes; top of head yellowish-buff; back grayish-brown, heavily overlaid with pale buffy-gray tips (color more buffy across the shoulders, more whitish-gray on the back); hump dark brown, small; rump grizzled grayish and brown, the light tipped hairs failing posteriorly and on the sides, the dark brown ground color passing into blackish-brown on thighs, legs, feet and tail; forelegs also blackish-brown; lips and point of chin yellowish-buff, followed by area of dark brown; underneck and underparts generally long haired and grizzled, the prevailing color yellowish-buff. Claws long, smooth, and moderately curved; brownish horn-color streaked with yellowish. Longest claw 56 mm. from upper base to tip (tip worn off).

*Cranial characters.*—Adult male: Skull small; similar in general form to *horriaeus*, but more wolf like; size of female *horriaeus*; rostrum strikingly narrow; frontal shield narrow and only faintly sulcate medially; temporal impressions not beaded [in *horriaeus* strongly beaded]; occipito-sphenoid length nearly as great as in *horriaeus*, but palatal and postpalatal lengths much less; posterior root of zygoma slender; post-orbital processes more slender, less depressed, and more pointed than in *horriaeus*. Teeth uniformly smaller.

***Ursus horriaeus texensis* subsp. nov.**

*Type* No. 203198 ♂ old, U. S. Nat. Mus., Biological Survey Collection. Killed in Davis Mts., Texas, November 2, 1890, by C. O. Finley and John Z. Means.

*Characters.*—Skull similar to *horriaeus* in size and general characters, but lower, flatter, more smoothly rounded, and broader across squamosals; frontal shield narrower and flatter; postorbital processes more slender and peg-like and more horizontally outstanding; orbital rims less swollen; rostrum smaller (shorter and more slender); fronto-nasal region even less dished; palate somewhat broader between molars, and deeply excavated between last molars (not excavated in *horriaeus*); interpterygoid canal shorter; inferior border of jaw (symphysis to subangular tubercle) much longer. Canines and molars smaller.

***Ursus navaho* sp. nov.**

*Type* from near Ft. Defiance (Mollhansen), probably killed in Chinsee Mts., northeastern Arizona. No. 3500 (skin No. 3571) U. S. Nat. Mus.

*Characters.*—Size small; skull short, broad, and moderately dished. Relationship apparently with *horrius*.

*Cranial characters.*—(Type specimen—a badly damaged old male of which only the front part with zygomata and lower jaw remain): Skull short; zygomata broadly spreading and outbowed, the anterior root much swollen, posterior root not expanded; frontal shield flat, short-pointed; postorbital processes peg-like and outstanding; temporal impressions beaded with a fine bead; rostrum short and small; nares rather small and nearly vertical; lachrymal duct opening on orbital rim, but more in

than out; palate broad for so small a skull; postpalatal shelf broad; coronoid blade high. Teeth small:  $m^1$  very small;  $m^2$  short, with broadly rounded heel (tooth nearly as broad posteriorly as in middle and anteriorly).

*Skull of old female* from Navaho Range, near Cromo, Colorado (Colorado Museum): Skull short, dished, with broadly spreading slightly bowed zygomata; truncate occiput, flattish shield, and slender widely outstanding postorbitals. Rostrum small, tapering, rising posteriorly into flat lyrate shield; postorbital processes long, slender, and directed forward as well as outward; braincase rather broad and depressed; palate concave; postpalatal shelf broad and flat. Teeth moderate: molars about same size as in male.

*Old male navaho compared with old male horriacus* (both types): Size somewhat less; rostrum and palate shorter; postorbital processes smaller and outstanding instead of decurved; zygomata more bowed and apparently more spreading; ramus shorter. Teeth smaller.

*Old male navaho compared with old male horriacus and old male texensis* (all types): Size somewhat less; rostrum and palate shorter; ramus of jaw shorter; molar teeth smaller; heel of last upper molar more broadly rounded posteriorly. The postorbital processes and zygomata are like those of *texensis*—the postorbitals small and outstanding, instead of decurved as in *horriacus*; the zygomata outbowed, instead of angular as in *horriacus*.

*Old female navaho from Navaho Mts. compared with old female horriacus from mountains north of Silver City, New Mexico*: Skull as a whole and rostrum shorter; occiput doubtless more truncate (that of old female *horriacus* sawed off); frontal shield shorter and more dished; postorbitals longer, more slender and directed anteriorly as well as outward; zygomata much more broadly spreading, more swollen at anterior base, and distinctly bowed, instead of angular; palate broader, flat instead of concave; lower jaw thicker and heavier.

#### **Ursus bairdi** sp. nov.

*Type* from Blue River, Summit Co., Colorado. ♂ old, No. 203805 U. S. Nat. Mus. Biological Survey Coll. (= 3147 Warren Collection).

*Characters*.—Size large—in the Rocky Mt. region exceeded only by *horribilis*; skull long, with narrow elevated fronto-nasal region; claws of moderate length, smooth.

*Color*.—(Male young-adult from Bearlodge, Sundance National Forest, Cook Co., eastern Wyoming. Killed February, 1887, by Paul Kleineidam): Muzzle pale brown (apparently old pelage); head and face blackish, becoming slightly grizzled posteriorly and on lower part of cheeks by wash of yellowish-brown tipped hairs; entire body, legs and feet very dark brown overlaid on back by wash of light tips. Claws of moderate length, strongly curved, smoothly polished, dark horn color marked toward tips with pale yellowish, and most of them with whitish (superficially) on upper side of basal half.

*Cranial characters* of old male (type, from Blue River, Colorado; and a closely similar old male from Sabille Hole, Laramie Co., southeast Wyoming, a little north of Cheyenne).—Size large; fronto-nasal region high and rather narrow; rostrum rather long, narrow and *strongly compressed* in front of orbits; face long-sloping; frontal shield flat, short-pointed, slightly sulcate or depressed medially; shield and nasals in essentially same plane except that anterior third of nasals is slightly upturned; post-orbital processes large, outstanding, and blunt; orbital rims prominent; sagittal crest long, high posteriorly; temporal impressions short, incurved, beaded; zygomata strongly outbowed, squarely spreading posteriorly; lachrymal duct slightly notching orbital rim (not squarely on rim as in most skulls from the region); squamosal shelf short, arched over meatus, the free edge thickened or everted; palate and postpalatal shelf moderate, rather narrow for so large a skull; mastoids long, divergent. Molars usually rather large.

Immature males of *bairdi*, up to at least the 5th or 6th year, have rather narrow convex frontal shields with weak decurved postorbital processes, and may be recognized at once by the form of the fronto-nasal region, which is *high, narrow and strongly pinched in* immediately in front of the orbits.

*Old male bairdi compared with old male horribilis*: Size somewhat smaller; frontal shield flatter and slightly narrower; fronto-nasal region elevated (never dished or sulcate between orbits); base of rostrum much more compressed laterally in front of orbits; palate shorter and narrower; mastoids longer and more divergent; meatus tube broadly rounded and free (not compressed between mastoid and glenoid); lower jaw as a whole shorter; ramus more swollen on outer side under  $m_2$  and  $m_3$ ; inferior border of ramus shorter and less upturned. Teeth smaller;  $m^1$  and  $m^2$  together 62 instead of 66;  $m^2$  less massive.

#### ***Ursus utahensis* sp. nov.**

*Type* No. 180193 ♂ old, U. S. Nat. Mus., Biological Survey Coll. From North Fork Salina Creek, 10 or 12 miles southeast of Mayfield, Utah. Collected May 22, 1911, by Mart Martenson.

*Characters*.—Size large; coloration apparently normal. Skull long, narrow, and high, but not arched; fronto-nasal region high and very narrow—strongly pinched in.

*Color*.—(Of skin of head of male killed on Pine Valley Mt., southwest Utah. Obtained from Forest Ranger September 24, 1907, by Clarence Birdseye. Orig. No. 989): Muzzle pale brown; face and throat, except pale lip edgings and long hairs of median line of throat, dark brown, becoming grizzled posteriorly; top of head very dark, grizzled posteriorly by brown-tipped hairs.

*Cranial characters of male ad.*—Size large; skull very long and narrow; zygomata moderately spreading; frontal shield narrow, flattened, falling away on the sides immediately in front of orbits, leaving a high naso-frontal ridge; sagittal crest long and high, reaching anteriorly nearly to

midway between fronto-parietal suture and plane of postorbital processes; postorbital processes very long, slender, peg-like, and horizontally extended; rostrum long, high, rather narrow and strongly compressed below the nasals; palate and postpalatal shelf exceedingly long; postpalatal notch narrow; interpterygoid fossa exceptionally deep; basisphenoid strongly concave; underjaw very long, ramus flat and *exceedingly broad vertically*; upper and lower molariform series of medium or rather small size; middle lower molar decidedly narrow.

An imperfect skull of an old male (No. 167390) from Pine Valley Mt., southwest Utah, differs from the type in having still smaller teeth both above and below, the molars, 4th premolar, and canines being but little larger than those of the female from the type locality.

The old male type of *utahensis*, compared with adult and old males of *bairdi* (the only neighboring species of approximately the same size), differs as follows: Rostrum longer and decidedly narrower; base of rostrum in front of orbits more compressed; postorbital processes longer and more slender; palate longer; postpalatal shelf narrower; interpterygoid canal much deeper; ramus of jaw longer, decidedly broader (vertically), flatter, and much thinner under 2d and 3d molars; upper molariform teeth, middle lower molar, and lower canine much smaller.

*Cranial characters of female:* An adult female (No. 180207) from the type locality is similar in general characters to the male, but much smaller and somewhat less extreme. Skull long and narrow; frontals and fronto-nasal region essentially same but sagittal crest shorter; zygomata relatively as well as actually much narrower (much less spreading) and not outbowed; rostrum narrowest anteriorly; molars smaller; canines much smaller.

#### ***Ursus kennerleyi* sp. nov.**

*Type* from mountains near Los Nogales, Sonora. ♂ old, skull No. 2086; skin No. 1047 U. S. Nat. Mus. Collected June, 1855, by Dr. C. B. Kennerly.

*Characters.*—Size rather small; skull long, narrow and high, but not much arched; rostrum narrow and high, in same plane with shield; fronto-nasal region strongly elevated, making a convexity slightly above otherwise continuous plane of rostrum and frontal shield; rostrum and naso-frontal region sub-terete, constricted (but not strongly pinched in) in front of orbits; nares much higher than broad; frontal shield flat, rather short-pointed posteriorly, passing into sagittal crest about  $\frac{1}{3}$  distance from fronto-parietal suture to postorbitals; postorbital processes long, rather slender, outstanding and slightly decurved; frontal part of braincase elevated; zygomata moderately spreading and outbowed; palate long, somewhat concave; squamosal shelves broad; coronoid broadly falcate; ramus flat and broad vertically. Teeth of medium size (badly worn).

*Remarks.*—*Ursus kennerleyi* is a strongly marked member of the *bairdi-utahensis* group. It is most nearly related to *utahensis* but very much

smaller and with teeth of about the same size. The skull, though an old male, agrees in size (length) with that of female *utahensis*.

***Ursus shirasi* sp. nov.**

*Type* No. 203030 ♂ old, U. S. Nat. Museum, Biol. Survey Collection. Killed September 16, 1913, at Pybus Bay, Admiralty Island, by George Shiras 4th, and presented to Biological Survey.

*Characters*.—Size large (somewhat larger than the largest *Ursus sitkensis*); head highly arched; color black, except muzzle, which is dull brown; claws dark blue-black, dull, slightly scurfy (not smoothly polished as in the Grizzlies), rather strongly curved and of moderate length (middle claw over curve 92 mm., from top of base to apex 75 mm.), 4th and 5th rounded off on outer side.

*Cranial characters*.—Skull large, broad, massive, and highly arched; zygomata large, broadly outbowed and rounded (not angular) anteriorly as well as posteriorly; frontal shield remarkably short and broad (nearly twice as broad as long), deeply and broadly sulcate, with huge uplifted broadly outstanding postorbital processes which arch over the orbits and are strongly decurved apically, completely roofing the orbits; temporal ridges beaded, short, meeting far forward (at least 25 mm. in front of fronto-parietal suture); sagittal crest long and high, humped over fronto-parietal suture, thickened posteriorly; fronto-nasal region dished; rostrum broad and short, sloping strongly upward to meet frontal shield; post-palatal shelf long; basioccipital and basisphenoid subequal; infrajugal process of maxillary obsolete; coronoid blade broad; ramus strongly bellied under posterior molar.

*Dentition*.—Heavy; canines large, the upper 47 mm. high above enamel line of outer side;  $pm_1$  with tiny cusplet on inner side posteriorly; molars large and rather broad;  $m^2$  with large and broad heel;  $m_1$  with strongly developed cusplet on inner side of saddle.

*Color*.—Entire animal except muzzle *coal black*, showing when examined closely a brownish wash along middle of back; muzzle from nose pad to between eyes dull brown.

*Remarks*.—*Ursus shirasi* is a very large member of the Brown Bear group. Whether or not it is always black, like the type specimen, is not known. But of all the American bears its skull is the most striking and distinctive. The short broad frontal shield rising on each side into huge postorbital processes which arch broadly over the orbits serve to distinguish it at a glance from all other species, rendering close comparisons unnecessary. In this connection it is interesting to observe that *shirasi* and its neighbor *culophus*, an inhabitant of the same island, present opposite extremes of departure from the normal ursine type—*culophus* having a long narrow skull with slender elongate rostrum, long and narrow frontal shield, and insignificant postorbital processes, while *shirasi* has an exceptionally broad skull with broad short rostrum, excessively broad and short frontal shield, and huge massive postorbital processes.

**Ursus kidderi tundrensis** subsp. nov.

*Type* No. 76470 ♂ adult, U. S. Nat. Mus., Biological Survey Coll. From Shaktolik River, Norton Sound, Alaska. Collected by natives September, 1894, and secured through Rudolf Neuman, late Agent of the Alaska Commercial Co. at Iliuliuk, Unalaska.

*Characters*.—Size small, agreeing in this respect with *kidderi*; skull rather long and heavy; frontals broad and flat, broadly but not deeply sulcate medially; postorbital processes small; coronoid blade falcate and rather high. Similar to *kidderi* in essential cranial and dental characters, but differing in having the frontal shield and postorbital processes *very much broader and flatter*, and the frontal sulcus less marked. As in *kidderi*, there is little difference in the sexes except that the females have narrower muzzles, and narrower frontal shields. A young male (No. 76465) from Andreafski on the lower Yukon, collected by E. W. Nelson, has somewhat shorter canines than the others.

From *alascensis*, the Grizzly of the same general region, skulls of *tundrensis* (adult males in both cases) may be distinguished by the following characters: size larger (basilar and occipito-nasal lengths fully an inch greater); skull as a whole much more massive; frontals broader, rising less abruptly from facial plane, less swollen over orbits; rostrum less slender; palate more flat; ramus of jaw thicker under 2d and 3d molars; coronoid blade more falcate; canines larger, decidedly longer, and somewhat less curved; molars decidedly larger.